The amendments submitted in the communication of 09.02.2005 bring in contents which, in contradiction to Article 34(2)(b) PCT, exceed the disclosed contents of the international application at the time of application. These are the following amendments: further details relating to the object to be achieved (page 2, lines 12-13 of the description) which do not have any basis in the original documents.

Reference is made to the following document:

D1: WO-A-03039929

<u>Claim 1</u>

The document D1 is provided as the closest prior art to the subject matter of Claim 1. It discloses (the references in brackets relate to this document):

a method which is suitable for suppressing incorrect messages in monitoring systems for electronic devices (page 2, lines 21-26, page 3, lines 18-26), in particular for sensor circuits for motor vehicles (page 6, line 35 - page 7, line 9), wherein fault messages each increment a counter (page 2, lines 27-35, page 7, lines 21-27) and an alarm (page 14, line 35 - page 15, line 5) is not triggered until a predefined counter reading is reached (page 2, lines 27-35).

The subject matter of Claim 1 therefore differs from the known method in that fault messages are derived using a program running on a processor if one of the input variables to be monitored exceeds respective limiting values which are predefined for it, in that the counter reading is checked to determine whether at least one fault message is present, and in that, if this is the case, a further check is carried out in advance for the relevant input variable.

The subject matter of Claim 1 is therefore novel (Article 33(2) PCT).

The object to be achieved with the present invention can thus be considered to be ensuring faster triggering of an alarm when there are a plurality of input variables.

The solution which is proposed for this object in Claim 1 of the present application is based, for the following reasons, on an inventive activity (Article 33(3) PCT):
by virtue of the fact that the counter reading is checked to determine whether at least one fault message is present, and that, if this is the case, a further check is carried out in advance for the relevant input variable, the monitoring of a variable which has already had attention drawn to it by a fault message is carried out in a prioritized fashion in terms of time. In this way the triggering of the alarm is speeded up significantly in comparison to the method disclosed in document D1.
Such a method is neither known from nor suggested by the submitted prior art.

Claims 2-6

Claims 2-6 are dependent on Claim 1 and therefore also fulfill the requirements of the PCT with respect to novelty (Article 33(2) PCT) and inventive activity (Article 33(3) PCT).

Claim 7

The subject matter of Claim 7 corresponds as an arrangement to the subject matter of Claim 1. For this reason it also fulfills the requirements of the PCT with respect to novelty (Article 33(2) PCT) and inventive activity (Article 33(3) PCT).

Description

Method and arrangement for suppressing incorrect messages in
monitoring systems

5

The invention relates to a method and an arrangement for
suppressing incorrect messages in monitoring systems for
electronic devices, in particular for sensor circuits for
motor vehicles.

10

For safety reasons, monitoring systems are frequently used
for electronic devices in which an incorrect output variable
which is caused by a fault in the device can bring about
hazards. It is therefore necessary to avoid faults in sensor

15 circuits for motor vehicles resulting in hazardous driving
situations, for example if a rotational speed sensor signals
a high rotational rate while the vehicle is maintaining its
course. However, other hazards and at least operational
faults may occur as a result of incorrect messages. Causes

20 of incorrect messages may be, for example, brief
disruptions, in particular voltage peaks, which are
interpreted by monitoring systems as faults without them
leading to falsification of the output variable of the
device.

25

In a method and a device for handling suspected faults
according to WO/039929 A1, there is therefore provision for
a counter to be incremented, with different measures being
taken when different threshold values are exceeded. When a

30 suspected fault does not occur, the counter can be set to
zero or decremented.

In the case of devices which are relevant to safety, it is
frequently necessary to react very quickly to a fault

35 message. The checking of the fault messages can, however,
take longer than permitted when there are a plurality of

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input variables to be monitored, due to the finite running time of the program in the processor. This applies in particular if a plurality of incrementations are necessary up to the point where the predefined counter reading is
5   reached, in order to avoid incorrect messages.

The object of the present invention is to largely prevent incorrect messages so that as far as possible only genuine faults lead to an alarm, which is then indicated or can be
10 fed to a superordinate system in order to ignore the output variable, and in order to ensure that an alarm is triggered quickly when there are a plurality of input variables.

This object is achieved according to the invention in that
15 fault messages are derived using a program running on a processor if one of the input variables to be monitored exceeds respective limiting values which are predefined for it, in that the respective counter is incremented by the fault messages, in that the counter reading is checked to
20 determine whether at least one fault message is present, and in that, if this is the case, a further check is carried out in advance for the relevant input variable, in that the fault messages each increment a counter, and in that an alarm is not triggered until a predefined counter reading is
25 reached.

The invention ensures that the monitoring of a variable which has already had attention drawn to it by a fault message is carried out in a prioritized fashion in terms of
30 time.

By means of one development of the method in which there is provision for the size of the increments and, if appropriate, of the decrements and the predefined counter
35 reading to be preselectable, the triggering of an alarm can be adapted individually to the type of respective fault

message. This development is preferably implemented by the preselectable variables being read out from a nonvolatile memory when the device is switched on.

5 In devices which are to be monitored it is generally expedient to monitor a plurality of variables, referred to below as input variables with respect to the method according to the invention. For this purpose, in the method according to the invention there is provision for fault
10 messages which each increment a counter to be derived from a plurality of input variables to be monitored, and for the size of the increments and, if appropriate, of the decrements, the predefined counter reading and limiting values of the variable to be respectively monitored to be
15 preselectable for each of the input variables to be monitored.

If a plurality of such fault messages are present, the further checking is preferably carried out in such a way
20 that when fault messages are present for a plurality of input variables the advance further checking of these input variables is carried out according to a previously defined priority list.

25 The invention also comprises an arrangement for suppressing fault messages in monitoring systems for electronic devices, in particular for sensor circuits for motor vehicles, in which it is provided that in a microprocessor it is possible to run a program with which fault messages are derived if
30 one of the input variables to be monitored exceeds respective limiting values which are predefined for it, and in that the respective counter is incremented by the fault messages, in that the counter reading is checked to determine whether at least one fault message is present, and
35 in that, if this is the case,

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further checking is carried out in advance for the relevant input variable, and in that an alarm is not triggered until at least one of the counters reaches a respectively predefined counter reading.

New Patent Claims

1.   A method for suppressing incorrect messages in monitoring systems for electronic devices, in particular for sensor circuits for motor vehicles, characterized in that fault messages are derived using a program running on a processor if one of the input variables to be monitored exceeds respective limiting values which are predefined for it, in that the respective counter is incremented by the fault messages, in that the counter reading is checked to determine whether at least one fault message is present, and in that, if this is the case, a further check is carried out in advance for the relevant input variable, in that the fault messages each increment a counter, and in that an alarm is not triggered until a predefined counter reading is reached.

2.   The method as claimed in claim 1, characterized in that the counter is decremented according to time periods without a fault message.

3.   The method as claimed in one of claims 1 or 2, characterized in that the size of the increments and, if appropriate, of the decrements and the predefined counter reading are preselectable.

4.   The method as claimed in claim 3, characterized in that the preselectable variables are read out from a nonvolatile memory when the device is switched on.

5.   The method as claimed in one of the preceding claims, characterized in that fault messages which each increment a counter are derived from the input variables to be monitored, and in that the size of the increments and, if

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appropriate, the decrements, the predefined counter reading and limiting values of the variable to be respectively monitored are preselectable for each of the input variables to be monitored.

6.   The method as claimed in one of the preceding claims, characterized in that, when fault messages are present for a plurality of input variables, the advance further checking of these input variables is carried out according to a previously defined priority list.

7.   An arrangement for suppressing incorrect messages in monitoring systems for electronic devices, in particular for sensor circuits for motor vehicles, characterized in that in a microprocessor it is possible to run a program with which fault messages are derived if one of the input variables to be monitored exceeds respective limiting values which are predefined for it, in that the respective counter is incremented by the incorrect messages, in that the counter reading is checked to determine whether at least one fault message is present, and in that, if this is the case, a further check is carried out in advance for the relevant input variable, and in that an alarm is not triggered until at least one of the counters reaches a respectively predefined counter reading.

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